

# TRANSFER-FACTORS FOR RADIONUCLIDES IN THE COAL-FIRED POWER PLANTS ENVIRONMENTS IN SERBIA

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## Abstract

During the coal combustion in power plants, radionuclides are distributed in solid and gaseous combustion products and discharged into environment. Radioactivity monitoring of coal-fired power-plants environments (PP Nikola Tesla, PP Kolubara, PP Morava and PP Kostolac) in Serbia was carried out during 2003-2006. Here are presented results concerning the soil-plant and ash-plant systems. Plant samples growing at the soil and ash disposals are analyzed by gamma spectrometry (HPGe detector, relative efficiency 23%) and corresponding transfer factors (TF) for natural isotopes  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$  and  $^{40}\text{K}$  were calculated and discussed. Obtained concentrations values of naturally occurring radionuclides are in following ranges: (0.4 – 29) Bq/kg  $^{226}\text{Ra}$ , (0.16 - 23) Bq/kg  $^{232}\text{Th}$ , (245 – 1274) Bq/kg  $^{40}\text{K}$ , (1.7 - 30) Bq/kg  $^{238}\text{U}$ , (0.08 - 4.7) Bq/kg  $^{235}\text{U}$ , (5.6 – 95) Bq/kg  $^{210}\text{Pb}$ ; (28 – 288) Bq/kg  $^7\text{Be}$  and man-made  $^{137}\text{Cs}$  in range 0.06 - 2.8 Bq/kg. Ash-to-plant and soil-to-plant transfer factors for  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$  and  $^{40}\text{K}$  are calculated for several sampling points. Values for both ash-to-plant and soil-to-plant transfer factors are much higher for  $^{40}\text{K}$  than  $^{226}\text{Ra}$  and  $^{232}\text{Th}$  probably due to different assimilation mechanisms of these elements by plants. Analyzed radionuclides have higher concentrations in the ash disposal than soil, and corresponding transfer-factors values obtained for ash-plant systems (ranged from 0,007 to 0,179 for  $^{226}\text{Ra}$ , from 0,015 to 0,174 for  $^{232}\text{Th}$  and from 0,418 to 2,230 for  $^{40}\text{K}$ ) are higher, indicating that there is no limit value for absorption in plants.

**KEYWORDS:** *plant, radionuclides, transfer factor*

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